

**ENSIGN-BICKFORD MAPLETON GROUNDWATER
CLEANUP PROJECT**
ADDENDUM TO STIPULATION AND CONSENT ORDER
AND
NATURAL RESOURCE DAMAGE CONSENT AGREEMENT

COMMENT RESPONSE SUMMARY
I. RESPONSE TO COMMON COMMENTS
DECEMBER 2006

Response to Common Comment No. 1 – Adequacy of Stipulated Penalties

Commenters raised questions about the adequacy of the stipulated penalty provisions in paragraph 9 of the Addendum. The \$250 per calendar day only applies to missing the “reporting deadlines” established by the Addendum. Each day the reporting deadline is missed an additional \$250 is assessed. The stipulated penalty of \$500 per day only applies for “failure to maintain the extraction and treatment facilities” or “failure to maintain Institutional Controls.” Neither of these stipulated penalties relieves Ensign-Bickford Company (EBCo) of the responsibility to comply with the underlying obligations, and the Executive Secretary may seek injunctive relief to obtain compliance. Further, any violation of State laws and rules or of the Addendum, not covered by a stipulated penalty provision, is subject to the provisions of Utah Code Annotated Section 19-5-115 for a civil penalty of up to \$10,000 per day. It should also be noted that any failure of EBCo to maintain and operate the extraction and treatment facilities could also directly affect adjustments to the irrevocable letter of credit of \$9,375,000 that is designed to provide financial assurance that the provisions of the Corrective Action Plan will be met.

***Response to Common Comment No. 2 – Claims of Well Owners and
Mapleton’s Claims***

Commenters raised concerns that the agreements do not resolve well owners claims or the City of Mapleton’s claims. The agreements do not settle claims of third parties, who are not parties to the agreements. Neither the Trustee nor the Executive Secretary has the authority to resolve these third-party claims. Paragraph VII.D. specifically indicates that “(t)he Agreement does not bind third parties who are not parties to this Agreement, and the Agreement does not resolve, or bar claims, if any, of third parties, including, but not

limited to, claims by political subdivisions of the State for interference with the quantity or quality of their water rights,...”

Response to Common Comment No. 3 – Adequacy of 20-year Cleanup Period

Commenters raised concerns that the clean-up period of 20 years is not long enough to remove contamination. The Corrective Action Plan (CAP) uses a 20-year period to assess cleanup actions. Based on information available, it is expected that this is an adequate time period for cleaning up the ground water contamination. However, it is recognized by both the CAP and the agreements that the time period for cleanup will require periodic re-evaluation. The progress of the clean-up and the amount of the financial assurance letter of credit will be reviewed on an annual basis to consider changes in the assumptions used to calculate projected costs. See the Addendum, Paragraph 8.

Response to Common Comment No. 4 – Cleanup to Background Levels

Commenters indicated that the clean-up level of contaminants in the ground water should be to pre-contamination (background) concentrations. It was also suggested that the company should be required to establish testing methods that can bring the pollution levels to a non-detectable level notwithstanding the cost involved.

The objective of the cleanup and the remedy for natural resource damages is to restore the groundwater to its highest and best use, which in the case of the aquifer in the Mapleton area is use for drinking water. Therefore, the Corrective Action Plan (CAP) requires cleanup to drinking water standards. The treatment plants that are part of the CAP produce drinking water quality water. Because there is no drinking water standard for RDX, the EPA health advisory number of 2 micrograms per liter (2 parts per billion) is used as the corrective action cleanup level, even though EPA has an ongoing assessment that may result in the health advisory for RDX being raised. The EPA health advisory for HMX is 400ppb. While it is understandable that individuals would want all of the RDX and HMX removed from their groundwater, it is not possible to do so and based on EPA’s health advisory levels, is not necessary to be protective of public health. As noted below, the treated water from the Mapleton GAC, Orton GAC, and Spanish Fork GAC all contain less than 0.21 ppb (below the detectable limit or Non-detect). If more stringent standards are required in the future, the groundwater cleanup plan can be re-evaluated.

The laboratory detection level currently achievable for RDX is 0.21 µg/L (0.21 ppb). This value is an order of magnitude below (more stringent than) the EPA Health

Advisory. The laboratories used by both EBCo [Southwest Analytical] and the State [Datachem] are approved by the State of Utah Health Department of Laboratory Services. Both of these labs employ EPA Method 8330, the method used to test for RDX, HMX, TNT, and other compounds listed in the CAP. Of these contaminants, RDX will be the hardest level to achieve and as such will most likely be the constituent that will determine when clean up has been achieved. The treatment facilities – Mapleton GAC, Orton GAC, and Spanish Fork GAC – all test below detection for treated water supplied by these systems. The maximum concentration in the outfall (treated water) will always be less than 0.21 µg/L (0.21 ppb), which is well below the EPA Health Advisory value of 2 ppb.

Response to Common Comment No. 5 – Objection to 3-year Provision for Use of \$2.58 Million

Commenters objected to the 3-year provision for use of the \$2.58 million. They view the 3-year period as a “punitive position, directed toward the city” and that the monies should be immediately available to the Trustee. The “3-year” provision has been removed from the Consent Agreement. See strikeout (deletion) of Paragraphs IV.B.2 and 3 of the Consent Agreement.

Response to Common Comment No. 6 – Consideration of Future Value of Water

In determining the settlement, Commenters are concerned that the future value of water was not considered. In calculating the damage, a comprehensive effort has been made to identify the value of the loss of the beneficial use of the impacted resource (ground water). The State, with data from the U.S. Geological Survey and other inputs, identified the safe yield, or the “use” potential, of the impacted aquifer at 4100 acre feet per year. The State identified the date when contamination of the ground water occurred and curtailed use of the aquifer. The State then noted the dates at which pump and treat operations with distribution capabilities were fully operational and noted how many gallons (or what percentage of the maximum safe yield/use potential) were capable of being returned to beneficial use. The Mapleton or Northern pump and treat system is capable of returning roughly 80% of the 4100 acre feet to beneficial use. The Spanish Fork or Southern pump and treat system returns the remaining roughly 20% of the resource to beneficial use. Ensign-Bickford Company’s (EBCo) commitment to operate these facilities over the period of time for aquifer cleanup, thereby providing drinking water quality water, restores the beneficial use of the ground water. The time periods computed for lost use for the Northern pump and treat system is 3 years, 8 months and for the Southern system, 4 years, 7 months. The State reviewed and identified the present

actual costs necessary to operate the Northern and Southern pump and treat systems and determined the actual costs avoided by not operating the pump and treat systems for this period of time. The State used the U. S. Environmental Protection Agency's (EPA) BEN Model as the template for calculating the economic savings during the period of lost use. This resulted in the Natural Resource Damage calculation of \$2,580,000.

EBCo is responsible for the costs of extracting and treating 4100 acre feet per year, whatever those costs may be, and the valuation takes into account future costs and the future value of the water. Further, the valuation of the irrevocable letter of credit, \$9.375 million, is present value, and it can be adjusted annually based on factors that may include increased future costs.

Response to Common Comment No. 7 – Boundary and Volume of Contaminated Groundwater

Concerns have been raised by commenters as to whether the plume may be larger than indicated in the Corrective Action Plan (CAP), and whether the injury may be more than 4100 acre-feet of water. The Consent Agreement is a settlement of a claim for the “Affected Area” that is defined as the area of contamination identified in the CAP. Under Section VI of the Consent Agreement, the State reserves the right to recover for damage for conditions that constitute materially greater injury to the ground water than the conditions that form the basis for the Agreement. Therefore, if the contaminant plumes have affected or in the future affect a quantity of water that is materially greater than 4100 acre feet, the Trustee may pursue a further claim.

Response to Common Comment No. 8 – Assurance of Cleanup of Ensign-Bickford Trojan Facility

Commenters have questioned whether the \$9.375 million trust fund takes into account the cost of disposal of media from treatment plants or explosives or if Ensign-Bickford goes out of business. The computation of the amount for the irrevocable letter of credit with standby trust (replacing the formerly proposed trust fund) for operation and maintenance of the treatment plants includes the costs of disposal of the media. During 2006, at the same time Ensign-Bickford Company (EBCo) was operating the ground water treatment facilities in Mapleton, the company was removing buildings and soils and treating contaminated soil to remove explosives contamination. This work continued even as EBCo announced that it would close the Trojan Facility. Furthermore, one purpose of the irrevocable letter of credit is to protect against Ensign-Bickford’s inability to meet its obligations under the agreements, by ensuring that funds will be available for the cleanup.

Response to Common Comment No. 9 – Use of Trust Funds

There is a misunderstanding by some commenters regarding the use of the trust fund. As indicated in the Response to Common Comment No. 2, the proposed agreements do not constitute a settlement of any claims Mapleton City may have against Ensign-Bickford Company (EBCo). The \$9.375 million irrevocable letter of credit with standby trust (replacing the formerly proposed trust fund) is designed to provide financial assurance that requirements of the Corrective action Plan (CAP), including operation and maintenance of the treatment systems will be met. These funds are provided by EBCo as part of requirements established by the Utah Water Quality Board. The CAP provides drinking water quality water to the public and at the same time that contaminated water is extracted to clean up the aquifer. The \$2.58 million trust fund is available to a purveyor of municipal water (Mapleton City) as approved by the Trustee for projects that “restore, replace, or acquire the equivalent of the resource (ground water) for the public in the Affected Area.” These funds are provided by EBCo to meet Natural Resource Damage claims brought by the Trustee for the State of Utah. The funds do not constitute a settlement of any Mapleton claims against EBCo.

Response to Common Comment No. 10 – Settlement Proposal

As indicated in the Response to Common Comment No. 2, the proposed agreements do not constitute a settlement of any claims Mapleton City may have against Ensign-Bickford Company (EBCo). However, the Trustee appreciates individuals sharing their considerations regarding settlements. Since the close of the public comment period, Mapleton City and EBCo have settled their litigation.

***Response to Common Comment No. 11 – Issues Regarding
ERM Modeling and Mapleton No. 1 Well***

Commenters have raised concerns about a report prepared by ERM consultants for a prior owner of the Trojan Facility. ERM was working for two of the prior owner-operators of the site. ERM and those who commissioned its services were provided an opportunity to verbally present its information and conclusions to the Division of Water Quality (DWQ) at the time it was doing its work. ERM did not persuade the Division that its assessment was valid or that further modeling work would be valuable. The DWQ specifically indicated that it expected field work, field data, and remediation.

While the ERM report cautions there may be an influence on CEM migration from pumping the Mapleton No. 1 Well, the ERM report also discusses a recommended pumping rate for ground water recovery in the regional aquifer (p. 15) of 150 gallons per minute (gpm) in two wells, for a combined pumping rate of 300 gpm. The ERM approach would have been much less expensive, but DWQ believes that a more aggressive remedial effort is required. The ERM model was on the order of one tenth of the design pumping rate of the currently installed ground water recovery system defined in the Corrective Action Plan and the safe yield calculated by the State (2,500 gpm). Pumping the Mapleton No. 1 Well as a point of recovery serves to intercept the CEMs along the observed flow pathway of the regional aquifer, rather than to alter that flow pathway. It also prevents further migration of what is believed to be an outer edge of the contamination plume. Six years of pumping experience and data collection for the Mapleton No. 1 Well as part of the implemented corrective action has not shown an increase in CEMs or nitrate concentrations in that well. In the most recent report, the 2005 Annual Ground Water Monitoring Report, nitrates and total specialty nitrates concentrations at the Mapleton No. 1 Well show statistically significant decreasing trends and RDX concentrations are stable.

Response to Common Comment No. 12 – Assessment of Breakdown Products

Section 7.2.4 of the Corrective Action Plan (CAP) presents a discussion of biodegradation issues in the regional aquifer. (See pages 75 – 81 of the CAP). This section was carefully reviewed by the State and accepted. In summary, parent compounds RDX and HMX were the initial focus of attention in the breakdown product assessment. For a combination of reasons (relatively low concentrations of HMX in the regional aquifer, lack of laboratory standards for postulated HMX breakdown products and lack of standardized laboratory methods for analyzing postulated HMX breakdown products), testing was not indicated or performed for the potential breakdown products of HMX.

A program of testing for potential breakdown products that focused on RDX was developed in cooperation with Utah Division Water Quality and implemented. From the literature, MNX, DNX and TNX were identified as the most likely breakdown products to be present, if any. Formaldehyde and hydrazine were also identified, at that time, as potential breakdown products, but at least hydrazine is no longer thought to be an RDX breakdown product. A set of three wells (representing the highest RDX values in the regional aquifer) was selected for testing. EBCo retained Dr. Spanggord, a recognized researcher in the area of MNX, DNX and TNX analysis, to perform the analyses of these compounds. Method Detection Limit (MDL) studies were performed. Finally, samples were collected and submitted for analysis. None of the potential breakdown products (MNX, DNX, TNX and formaldehyde) were present at levels above their analytical detection limits. The end result of these investigations was to conclude that there is no evidence of RDX biodegradation in the regional aquifer at this site at levels that are

detectable at about a one part per billion detection limit. Other possible breakdown products are less toxic than the parent compound.

The DEQ has 122 journal articles that discuss various theories, case studies and possible treatment scenarios for these breakdown products on file for review.

Additionally, U.S. Filter, the company supplying the filters used on Mapleton No.1 GAC, the Orton GAC and the Spanish Fork GAC, concur that this system will work well on removing the nitro-derivatives.

Response to Common Comment No. 13 – Health Study of Impacts of Contaminants on Public Health

Several individuals provided public comment expressing concern that the ground water contamination of private wells and the public drinking water system had caused health problems, especially in citizens in the south end of Mapleton. The health conditions cited included heart disease, stroke, and different cancers among many other conditions. They requested door-to-door studies be done to determine if there is an association between possible exposure to drinking water contaminants and these health conditions.

In recognition of the concern raised in the past was about cancer, and since several Mapleton residents in the south part of the city suffered from non-Hodgkins lymphoma, the Utah Department of Health Office of Environmental Epidemiology agreed to review the incidence rates of all cancers occurring in Mapleton residents from 1978 through 2001. A few previous environmental health studies in other parts of the nation have suggested an association between high levels of nitrates in drinking water and non-Hodgkins lymphoma. This Utah Department of Health study was completed and a final report was issued in January of 2004. Copies of this study were distributed at the August 2004 Public Meeting to all of those who expressed interest in it. A copy of the study is also available from the Utah Department of Environmental Quality. This investigation of cancer incidence in Mapleton over this 24-year period identified statistically significant lower rates of colon and rectal cancer, lung cancer and mouth and throat cancer. Only one cancer showed a statistically significant higher rate in Mapleton residents and this was in rare soft tissue cancers of muscle and connective tissue. Regarding non-Hodgkins lymphoma, the 4th most common cancer in the general population affected 18 individuals in Mapleton over this 24-year time span. Statistically, twelve cases of this cancer would have been expected in a comparable population, but the number of non-Hodgkins lymphoma cases was not statistically significant, which means that this amount of difference (between 12 cases and 18 cases) would be seen more than 5% (1 in 20 occurrences) of the time simply by chance. While a more detailed door-to-door study as requested of the small area in the south end of town could not be justified based on this investigation of cancer incidences, it would be difficult to show statistical significance with an even much smaller population size, and to quantifying amounts of possible

exposures to environmental contaminants with questionable relationship to the illnesses to be studied.

Response to Common Comment No. 14 – Solid and Hazardous Waste Cleanup of Ensign-Bickford’s Trojan Property

The Division of Solid and Hazardous Waste has evaluated on-site contamination at the Ensign-Bickford facility and continues to work with Ensign-Bickford to cleanup contamination at the facility.

Under the hazardous waste regulations, Ensign-Bickford was required to conduct a site wide investigation of all areas where waste materials have been managed during the operational life of the facility. A site wide investigation is an involved and difficult process, especially when the contaminants of concern are explosives. Ensuring the investigation was not only thorough but conducted in a safe manner is of the utmost importance to the Division.

Forty-four sites were identified for investigation at the facility. To fully evaluate all of the sites more than 300 surface soil samples and 1000 subsurface soil samples have been collected. Based on the results of the investigation, only six sites have been determined to have significant concentrations of explosives. At one location, buried equipment and impacted soil containing explosives were excavated and thermally treated on-site. At other locations, hundreds of tons of soil has been excavated and consolidated in one area prior to on-site treatment or transportation to a permitted off-site waste management facility.

Twenty-four shallow and deep ground water monitoring wells have been installed at the facility. The groundwater monitoring data appears to indicate that groundwater contamination is contained to narrow areas along former disposal trenches. An assessment of impact from perched aquifers to the regional aquifer continues.

Based on the data collected to date, it appears the on-site sources of contamination would have a minimal impact to the existing groundwater contamination. Any potential impact has been further lessened by the on-site treatment and removal of contaminated soils. The Division is currently working with Ensign-Bickford to ensure the facility is cleaned up.